

only cause which could have given rise to the septicæmia, considering that neither streptococcus nor staphylococcus, the usual causes of septicæmia, were found; and also that before, as well as during the operation, no characteristic septic peritonitis could be discovered. Furthermore the autopsy showed only to a very limited extent any trace of peritonitis, and it can be assumed that this case was not the ordinary form of septicæmia, as the streptococcus is wont to produce. In fact it must be further assumed that aside from the already known forms of septicæmia caused by the streptococcus puerperalis, is still another form caused in puerpera by the above described bacillus—the bacillus septicus hominis.

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CRANIO-CEREBRAL TOPOGRAPHY AND ITS SURGICAL APPLICATION.

The appearance of two separate volumes from the French gives increased interest to this important subject.¹ Both are exceedingly valuable contributions to the topographical knowledge of the skull and brain. As a basis or starting point for the study of the topography of the encephalon, Poirier selects four points: 1st, the middle of the naso-frontal suture or the vertex of the naso-frontal angle (nasion of Broca): 2d, the external occipital protuberance (inion of Broca): 3d, the external auditory meatus: 4th, the lambda or point of union of the lambdoidal and sagittal sutures. The first mentioned or that represented by the vertex of the naso-frontal angle can, as a rule, be easily identified. The second if not easily recognized, may be, in even the most difficult, by strongly flexing the head. The tension exerted by the ligamentum nuchæ leads to its recognition or it may be detected by following the superior occipital ridge or line. The third point, the external auditory meatus bears a constant relation to the contents of the cranium as shown by numerous cranio-metric measurements. The

¹P. Poirier: *Topographie cranio-encéphalique. Trépanation.* Paris, Lecrosnier et Babé, 1891. 92 pages.

R. Le Fort. *La topographie cranio-cérébrale. Applications chirurgicales.* Paris, F. Alcan, 1890, 165 pages.

lambda or point of junction of the lambdoidal and sagittal sutures is to be found by tracing the irregularity in the upper angle of the occipital bone which can generally be felt through the skin and by bearing in mind that it is distant from the external occipital protuberance from 6 to 7 cm.

The zygomatic arch gives the horizontal direction. By adopting these points the author regards as landmarks, the glabella, the zygomatic process and the parietal eminence. In mapping out the fissures of Sylvius and Rolando a line is drawn through the naso-frontal suture and the lambda, passing 6 cm. above the external auditory meatus.

The cerebral centres definable by these lines are discussed by the author as well as the localization of the more important sinuses from a surgical standpoint, particularly the speno-parietal sinus. For the localization of the cerebellum as well as the posterior portion of the transverse sinus P. draws a line from the upper edge of the zygomatic arch to the external occipital protuberance. Below this line the localization of the cerebellum is to be fixed and above it the transverse sinus.

In order to determine whether or not these lines hold good in the cranium of the infant, P. examined the skulls of twenty children. As a result of this investigation he determined that no absolute variation existed so far as the fissure of Rolando is concerned: the fissure of Sylvius, however, exhibited decided variations compared to the adult head. This furrow was found to be situated relatively higher to the temporal suture and first and second convolutions than in adults. This difference, he considers to be due, not so much to a difference in the development of the encephalon as to that in the cranium.

A most important portion of the author's work relates to the rules governing the indications for operation for exploratory trephining. Cerebral abscess is ably discussed, particularly those foci of suppuration developing after suppurative inflammation of the middle ear. He declares that 70 per cent. of these were located in the temporal and 30 per cent. in the occipital region. In order to reach the former the author proposes to trephine at a point 3 cm. in a vertical line above the external auditory meatus. This differs from von Bergmann's point which is somewhat posterior to this line: while Macewen's is

nearly on this line but at a greater distance from the meatus. In order to reach abscesses in the cerebellum the author recommends the trephine to be applied midway on a line drawn from the point of the mastoid process to the occipital protuberance.

In the matter of spontaneous cerebral hemorrhage the author agrees with Erd in condemning Horsley's proposal to ligate the carotids. The trephine is advocated by P. in hydrocephalus.

In puncture of the ventricles he recommends the trephine to be placed 4 cm. directly above the external auditory meatus for the reason that better drainage can be obtained from this point than when the puncture is made from the occipital direction: nor does refilling occur as rapidly as when approached from the frontal. Horsley's and Brinkhardt's work in this line of operative interference in cases of purely nervous and psychical disturbances is but barely noticed.

As to the technique of the operation P. follows essentially the rules of the present day. He lays stress upon the hypodermic use of morphia prior to the administration of chloroform, claiming that it procures contraction of the vessels. In establishing the incision he he lays more stress upon the necessity of providing proper nutrition for the flap than drainage, hence as a rule the base is directed downwards. In stating the error which may occur he declares that it does not exceed 2 cm. The cavity of the dura is opened by a flap rather than a cross incision. The use of the thermo-cautery is deplored in cerebral surgery, hemorrhage being arrested by tampons of iodoform gauze. The method of temporary resection of the skull devised by Wagner is modified by P., the horizontal lines of the omega-shaped incision being omitted.

The concluding chapter of P's work includes a description of some osteoplastic operations upon the skull, remarks upon the technique of craniotomy, a discussion of trephining the mastoid, etc.

Le Fort's preference for purposes of localization is for six points or landmarks, namely, the glabella, external occipital protuberance, the superior and posterior edge of the zygomatic process of the frontal bone, middle of the zygomatic arch, the point of junction of the occipital parietal and temporal bones (junction of the lambdoidal and parieto-mastoid sutures) or asterion of Broca. The following lines are

then drawn : commencing at the glabella, a line passes to the external occipital protuberance. On this line 67 to 70 millimetres from the protuberance, the lambda or point of union of the sagittal and lambdoidal sutures, is located, the uppermost limit of the fissure of Rolando is also situated at this point. The distance of the latter point from the glabella varies from 154 to 191.5 millimetres. The entire length of the sagittal line, nasion toinion, varies from 29 to 36 cm. in the adult head. The direction of the fissure of Rolando is indicated by a line drawn from the middle of the zygomatic arch in a direction to intersect the sagittal line at the lambda. A third line is drawn from the zygomatic process of the frontal bone to the lambda. The fissure of Sylvius is localized, as follows : Starting from a point 2.7 cm from its beginning 4 to 6 cm are measured along this line. The lower limit of the fissure of Rolando is found at a point 10 to 15 millimetres above the intersection of this third line with that upon which the last named fissure is located (the second line). Finally, Le Fort identifies the motor centres of this region by lines drawn from the asterion to the lambda and upper angle of the fissure of Rolando. In corroboration of the reliability of these lines Le Fort trephined the skulls of cadavers with the result of varying in no instance more than six millimetres from the motor centre intended to be reached. It would, therefore, seem that in the hands of their originator the employment of these points and lines of Le Fort are fairly successful in localizing those motor centres of the brain which in recent years have been the subject of special study by Ferrier, Horsley, Broca, Championnière and others. But it is to be very much doubted if the same success will follow their use in the hands of others. This is to be attributed mainly to the difficulty involved in locating some of the points upon the surface. For instance, one can scarcely believe the author is justified in stating that the asterion or junction of the occipital parietal and temporal bones can be easily identified by the sense of feeling. The attempt at identification of the middle of the zygomatic arch will likewise be conceded to be more or less a matter of guess work.